Ancient Scientific Basis of the "Great Serpent" from Historical Evidence

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ABSTRACT

Zoological data and a growing mythology contributed to ancient Western knowledge about large serpents. Yet little modern attention has been paid to the sources, transmission, and receipt in the early Middle Ages of the ancients' information concerning "dragons" and "sea serpents." Real animals—primarily pythons and whales—lie behind the ancient stories. Other animals, conflations of different animals, simple misunderstandings, and willful exaggerations are found to account for the fanciful embellishments, but primitive myths played no significant role in this process during classical times. The expedition of Alexander the Great into India (327–325 B.C.) and the Bagradas River incident in North Africa (256 B.C.) had enormous repercussions on the development of serpent lore. Credible evidence is found for the presence of ancient populations of pythons living along the North African coast west of Egypt and along the coast of the Arabian Sea between the Indus River and the Strait of Hormuz—places where they no longer exist today. The maximum sizes of ancient pythons may have been greater than those of today's specimens.

ANCIENT LITERATURE AND ART are peppered with depictions of huge serpents of various kinds. Certain similarities among all these serpents, however, occur across many cultures, as modern scholarship has abundantly shown.[1] The great serpent is always a snake, terrestrial or aquatic, and it acts either beneficently or harmfully toward human

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[1] Joseph E. Fontenrose, *Python: A Study of Delphic Myth and Its Origins* (Berkeley: Univ. California Press, 1959); Peter Hogarth and Val Clery, *Dragons* (London: Allen Lane, 1979); Karl Shuker, *Dragons: A Natural History* (London: Arum, 1995); David E. Jones, *An Instinct for Dragons* (New York: Routledge, 2000); and Michel Meurger, *Histoire naturelle des dragons* (Rennes: Terre de Brume, 2001). These works, like most others, discuss mainly the mythological aspects of the ancient great serpents.

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beings. Three main sources of information during antiquity could have contributed to forming the medieval, and hence the modern, picture of the great serpent: primitive myths, ancient inferences drawn from fossils of prehistoric beasts, and ancient historical observations of rare snakes and other animals.

The earliest mythological literature, being nonscientific and difficult to treat scientifically, does not much concern us here. Nevertheless, the unknown (and probably unknowable) origin of the early serpent myths must have resided, to some extent, in actual observations of large snakes. (See Figure 1.) I will argue here that the primitive myths traveled a separate path—via poetry and art—into the Middle Ages, where they then gradually became confused and blended with the more scientific tradition. The very infrequently studied fossil evidence has recently been thoroughly surveyed and analyzed by Adrienne Mayor.[2] Curiously, there is little to show that remains of prehistoric animals led in any obvious way to the development of the concept of the great serpent during classical times, although they may have influenced the early myths. Nonetheless, people in ancient times occasionally stumbled upon, and speculated about, large fossils, typically interpreting them as evidence of former giants. Very long fossil bones, such as the backbones of whales, as well as odd-shaped fossil heads of animals could have been associated with great serpents, according to Mayor, although the evidence remains circumstantial. This then leaves the historical evidence, which is the subject of this essay. My intention here is to show what the factual Western evidence is, how the various ancient reports propagated through the

Figure 1. *Sea serpent. Greek islands, chalcedony gem (fifth century B.C.). By permission of the Metropolitan Museum of Art, New York. Bequest of William Gedney Beatty, 1941. (41.160.437.)*

[2] Adrienne Mayor, *The First Fossil Hunters: Paleontology in Greek and Roman Times* (Princeton, N.J.: Princeton Univ. Press, 2000).

classical literature, and how this ancient legacy was received by early medieval scholars. Such a study should prove fruitful because it bears not only on the general history of zoology but also on current scientific and cultural studies of known and suspected large serpents. In our modern Western world, suspected large serpents are often associated, plausibly or not, with the ancients' terrestrial "dragons" and marine "sea serpents."

Modern scholarly studies of the relevant ancient literature are surprisingly sparse, considering the perennial popularity of the topic of dragons and sea serpents. Erich Pontoppidan in 1755 discussed a small number of references to possible sea monsters from the Bible and from the works of Diodorus Siculus, Pliny the Elder, and various writers on the Bagradas River serpent. In 1892 A. C. Oudemans briefly surveyed the same material, adding a few more references. Bernard Heuvelmans in 1968 focused on particular passages from Aristotle and Pliny, giving little attention to other authors. This is unfortunate, because the two passages from Aristotle and Pliny that he regarded as describing a giant sea serpent are instead suggestive, in the first case, of a shark or a sea snake ("a black cylindrical beam" of unspecified length) and, in the second case, of a breaching whale ("rising up like a huge column and belching out a kind of deluge"), as Jules Cotte had already shown. In recent decades, Richard Ellis generally deferred to the work of Heuvelmans for the ancient period, while John Boardman as well as John K. Papadopoulos and Deborah Ruscillo discussed sea monsters more from the mythological and artistic than from the scientific point of view.[3]

As for large land snakes, Hans Gossen and August Steier in 1921 compiled many ancient references but did not systematically analyze their collected data. Rather, they simply grouped the snakes alphabetically under their ancient rubrics and gave modern taxonomic identifications whenever possible.[4] With few exceptions, modern scholars have dismissed most of the reported large serpents (terrestrial or aquatic) as ordinary snakes—without, however, presenting data and analysis adequate to show how they reached such a conclusion and certainly without tracing the chronological record of these reports throughout antiquity.

The full treatment given here focuses attention first on a famous incident at the Bagradas or Bagrada (modern Medjerda) River in North Africa in 256 B.C. This event had important repercussions down through antiquity into the Middle Ages, as will be shown. Next, further serpent reports out of Africa, India, the Middle East, and Europe are collected. These allow the impact of Alexander the Great's expedition into India to be assessed by contrasting the growth of the Alexander Romance—a collection of legends about Alexander's expedition—with the actual facts about snakes. Finally, the reception of these ancient historical

[3] Erich Pontoppidan, *The Natural History of Norway* (London: Linde, 1755), Vol. 2, pp. 195–210; A. C. Oudemans, *The Great Sea-Serpent: An Historical and Critical Treatise* (Leiden: Brill, 1892); Bernard Heuvelmans, *In the Wake of the Sea-Serpents* (New York: Hill & Wang, 1968); Aristotle, *History of Animals* 532b18–22; Pliny the Elder, *Natural History* 9.8; Jules Cotte, *Poissons et animaux au temps de Pline: Commentaires sur le livre IX de l'Histoire naturelle de Pline* (Paris: Lechevalier, 1944); Richard Ellis, *Monsters of the Sea* (New York: Knopf, 1994); John Boardman, "'Very Like a Whale': Classical Sea Monsters," in *Monsters and Demons in the Ancient and Medieval Worlds,* ed. A. E. Farkas, P. O. Harper, and E. B. Harrison (Mainz: Zabern, 1987); and John K. Papadopoulos and Deborah Ruscillo, "A *Ketos* in Early Athens: An Archaeology of Whales and Sea Monsters in the Greek World," *American Journal of Archaeology,* 2002, *106:*187–227.

[4] Hans Gossen and August Steier, "Schlange," in *Real-Encyclopädie der classischen Altertumswissenschaft,* ed. A. F. von Pauly and G. Wissowa, Vol. 2A, Pt. 1 (Stuttgart: Metzler, 1921), cols. 494–557. See also the updates by A. S. F. Gow and A. F. Scholfield, *Nicander: The Poems and Poetical Fragments* (Cambridge: Cambridge Univ. Press, 1953), pp. 18–21; John Scarborough, "Nicander's Toxicology, I: Snakes," *Pharmacy in History,* 1977, *19:*3–23; and Liliane Bodson, "Observations sur le vocabulaire de la zoologie antique: Les noms de serpents en grec et en latin," *Documents pour l'Histoire du Vocabulaire Scientifique,* 1986, *8:*65–117.

reports by the earliest medieval scholars provides a basis of support for the many modern studies that have traced the development of serpentology from the early Middle Ages on.

THE BAGRADAS RIVER INCIDENT

In the late summer of 256 B.C., midway through the First Punic War, a Roman consular army invaded North Africa. Landing at Cape Bon in what is now Tunisia, the army proceeded southwest down the long peninsula into the thickly inhabited districts around Carthage, capturing the hilly open country and some four hundred towns and fortresses. Polybius (ca. 150 B.C.), our main authority, does not state how long this operation lasted, but the large number of Roman acquisitions (even allowing for rapid capitulation in many cases) suggests a campaign of months rather than days. Although Polybius named only the towns of Aspis (modern Kelibia?), Adys (modern Oudna?), and Tunis, we may take the mutual distances of these towns (some tens of miles) as indicative of the range of Roman operations around Carthage.[5] The rich agricultural districts to the northwest—especially the strategic town of Utica, a little west of the mouth of the Bagradas River—fall easily within this range and in any case posed an obvious target for the Roman army. It is, therefore, not at all improbable, though J. F. Lazenby and David Wardle raised some questions about it, that the Romans had both enough time and enough motive to reach the Bagradas River, the major drainage conduit in the region, which spills into the Mediterranean Sea about 15 miles from Carthage.[6]

Polybius never mentioned that the Roman expeditionary force, which was now under the sole command of the consul Marcus Atilius Regulus, was encamped by the Bagradas River. On the other hand, this detail is related by many other authorities in connection with the incident I intend to discuss. It must be remembered that the First Punic War appears in Polybius's history only as a part of his introduction and was not accorded a full-scale treatment. Furthermore, by his own acknowledgment he was writing mainly political and military history, and he roundly blamed other historians for reporting sensational incidents merely in order to entertain readers.[7]

Fortunately, other ancient historians were not so fastidious or so narrow in their professional outlook. None of the many writers whose extant works mention the Bagradas River incident, however, lived earlier than the first century A.D. Moreover, they cited as their authorities only Tubero and Livy, who were historians of the first century B.C. The most detailed account is preserved by Orosius (ca. A.D. 417), who probably derived it from the now lost Book 18 of Livy's *Roman History:*

> Regulus, chosen by lot for the Carthaginian War, marched with his army to a point not far from the Bagradas River and there pitched his camp. In that place a reptile of astonishing size devoured many of the soldiers as they went down to the river to get water. Regulus set out with his army to attack the reptile. Neither the javelins they hurled nor the darts they rained upon its back had any effect. These glided off its horrible network of scales as if from a slanting

[5] Polybius, *Histories* 1.29–30. See also Florus, *Epitome* 1.18.19; Appian, *Punic Wars* 1.3; Eutropius, *Breviary* 2.21; and Orosius, *Against the Pagans* 4.8. For modern place names see M. F. Fantar, "Régulus en Afrique," in *Punic Wars,* ed. H. Devijver and E. Lipiński (Leuven: Peeters, 1989), pp. 75–84.

[6] Ettore Pais, *Storia di Roma durante le Guerre Puniche* (Rome: Optima, 1927), p. 307; J. F. Lazenby, *The First Punic War: A Military History* (Stanford, Calif.: Stanford Univ. Press, 1996), p. 100; and David Wardle, *Valerius Maximus: Memorable Deeds and Sayings,* Bk. 1 (Oxford: Clarendon, 1998), p. 288.

[7] Claudine Herrmann, "Le cas d'Atilius Regulus," *Iura,* 1963, *14:*159–175. Polybius's philosophy of history is discussed in J. B. Bury, *The Ancient Greek Historians* (New York: Macmillan, 1909).

> testudo of shields and were in some miraculous fashion turned away from its body so that the creature suffered no injury. Finally, when Regulus saw that it was sidelining a great number of his soldiers with its bites, was trampling them down by its charge, and driving them mad by its poisonous breath, he ordered *ballistae* brought up. A stone taken from a wall was hurled by a *ballista;* this struck the spine of the serpent and weakened the constitution of its entire body. The formation of the reptile was such that, though it seemed to lack feet, yet it had ribs and scales graded evenly, extending from the top of its throat to the lowest part of its belly and so arranged that the creature rested upon its scales as if on claws and upon its ribs as if on legs. But it did not move like the worm, which has a flexible spine and moves by first stretching its contracted parts in the direction of its tiny body and then drawing together the stretched parts. This reptile made its way by a sinuous movement, extending its sides first right and then left, so that it might keep the line of ribs rigid along the exterior arch of the spine; nature fastened the claws of its scales to its ribs, which extend straight to their highest point; making these moves alternately and quickly, it not only glided over levels, but also mounted inclines, taking as many footsteps, so to speak, as it had ribs. This is why the stone rendered the creature powerless. If struck by a blow in any part of the body from its belly to its head, it is crippled and unable to move, because wherever the blow falls, it weakens the spine, which stimulates *the feet of the ribs* and the motion of the body. Hence this serpent, which had for a long time withstood so many javelins unharmed, moved about disabled from the blow of a single stone and, quickly overcome by spears, was easily destroyed. Its skin was brought to Rome—it is said to have been one hundred and twenty feet in length—and for some time was an object of wonder to all.

(See cover illustration.) All of our ancient authorities agree on the great length of the reptile. Eight of them provide exactly the same value for the length, one gives a rounded number, and three more merely refer to the reptile's huge size.[8] Cassius Dio (ca. A.D. 229), who is quoted by Zonaras and John of Damascus, mentioned that the thickness of the reptile's body was proportionate to its length and added that the flayed skin was measured at the instruction of the senate at Rome. The jawbones, according to Pliny the Elder (A.D. 77), were also shipped to Rome: along with the skin, they survived in a temple there down to the Numantine War, which ended in 133 B.C.[9]

Contrary to the testimony of Orosius, seven ancient authors claim that the reptile was felled by numerous blows from more than one *ballista.* For this assertion, Aulus Gellius cited Tubero and Valerius Maximus cited Livy. In any case, according to Valerius Maximus, after its demise the reptile's blood and innards polluted the local air and water for a considerable time. Much later, the strange episode was held to portend the defeat and capture of the general Regulus early the following year.[10]

[8] Orosius, *Against the Pagans* 4.8, trans. by Irving W. Raymond, *Seven Books of History Against the Pagans: The Apology of Paulus Orosius* (New York: Columbia Univ. Press, 1936), pp. 170–171. I have made a few changes in Raymond's translation; the phrase "the feet of the ribs" is italicized in light of the discussion below. See also the summary (*Periocha*) of Livy's Book 18. The eight sources that note the reptile's length as 120 feet are Valerius Maximus, *Memorable Deeds and Sayings* 1.8, ext. 19; Pliny the Elder, *Natural History* 8.37; Aulus Gellius, *Attic Nights* 7.3; Vibius Sequester, *Geography,* s.v. "Bagrada"; Orosius, *Against the Pagans* 4.8; Nepotianus, *Epitome* 1.8, ext. 19; John of Damascus, *Dragons* 1; and Zonaras, *Annals* 8.13. The rounded number of 100 cubits (about 150 feet) is offered by Silius Italicus, *Punica* 6.153 (whose full version of the story is told in 6.140–293, 6.677–679). Those who simply describe the monster as huge are Seneca, *Letters* 82.24; Florus, *Epitome* 1.18.20; and Arnobius, *Against the Pagans* 7.46(43).

[9] The temple remains unidentified. Fowler suggested that the relic was presented as a religious offering to the temple of Aesculapius on Tiber Island: W. Warde Fowler, *Roman Essays and Interpretations* (Oxford: Clarendon, 1920), pp. 178–181. Another possible site is the Capitoline temple of Jupiter, Juno, and Minerva, which was the repository of many military trophies and became the scene of a destructive riot in 133 B.C.: Velleius Paterculus, *Roman History* 2.3.2; Plutarch, *Tiberius Gracchus* 19–21; and Appian, *Civil Wars* 1.15–16. It is worth recalling that serpents were sacred to Juno (Hera) as well as to Aesculapius. The Garden of the Hesperides, which was guarded by Hera's great serpent, lay in North Africa.

[10] Valerius Maximus, Seneca, Pliny the Elder, Silius Italicus, Aulus Gellius, Nepotianus, and Zonaras point to

What are we to make of this story? The Bagradas River creature is always referred to by our ancient authorities as a *serpens*—traditionally meaning a large snake. Valerius Maximus specifically noted what seemed to be tail coils in order to identify the creature as a snake. Similarly, Pliny the Elder gave as a comparative the *boa* snakes, and Arnobius offered other snake examples. Silius Italicus, because he was writing epic poetry, enhanced the snake image by adding a crest and a three-forked tongue, stock Virgilian features.[11]

Modern commentators have varied widely in their interpretations. If the creature was a known reptile of some modern kind, then B. C. Niebuhr, Robert Gessler, W. Warde Fowler, Ettore Pais, and Karl Shuker agree that its reported size must have been greatly exaggerated. Niebuhr went so far as to suggest that it was all an invention of Naevius for his epic poem (now lost) about the First Punic War, in which he had served.[12] However, the many technical details given by Orosius are not likely to have been invented or even to have appeared in an epic poem. For the same reason, we may reject the outright dismissal of the story by J. F. Lazenby and Yann Le Bohec. It is interesting to observe, however, that most other commentators—Edward L. Bassett, Claudine Herrmann, Michel Martin, François Spaltenstein, Uwe Fröhlich, and David E. Jones—have remained noncommittal.[13] Toward the other extreme are those scholars who have regarded the story as being true but containing exaggerations. Gessler's identification of the creature as a Nile crocodile has been adequately refuted by Fowler, who, like Shuker, instead proposed a huge water serpent of some now-extinct species. The most extreme view is that of Pontoppidan, who suggested that the creature was a monstrous sea serpent of unknown type.

If we accept the details of the story as true, a close examination reveals only one fact that stands in opposition to the original idea that this was a large snake, such as a python. The troublesome fact is the creature's universally reported length of 120 feet.[14] No python (or other snake) known today has a length exceeding about 30 feet.[15] Otherwise, the reported features are credibly those of a snake: the sinuous, lateral movement; the even grade

numerous blows from more than one *ballista.* For interpretations of this episode as portending the defeat of Regulus see Livy, *Periocha,* Book 18; Silius Italicus, *Punica* 6.286–290; and Florus, *Epitome* 1.18.20. See also François Spaltenstein, *Commentaire des Punica de Silius Italicus (livres 1 à 8)* (Geneva: Droz, 1986), p. 410.

[11] Virgil, *Aeneid* 2.206–207, 2.475.

[12] B. C. Niebuhr, *Lectures on the History of Rome, from the Earliest Times to the Fall of the Western Empire* (London: Taylor, Walton & Maberly, 1849), pp. 30–31; Robert Gessler, "Zur früheren Verbreitung des Nilkrokodils," *Zoologischer Beobachter (Zoologische Garten),* 1915, *56:*257–263; Gessler, "Atilius Regulus in Africa serpentem portentosae magnitudinis cum magna militum clade occidit (Liv. Epit. 18)," *Korrespondenzblatt Württembergs,* 1916, *23:*38–43; Fowler, *Roman Essays and Interpretations* (cit. n. 9); Pais, *Storia di Roma* (cit. n. 6); and Shuker, *Dragons* (cit. n. 1), pp. 26–29.

[13] Lazenby, *First Punic War* (cit. n. 6); Yann Le Bohec, *Histoire militaire des guerres puniques* (Monaco: Rocher, 1996), p. 88; Edward L. Bassett, "Regulus and the Serpent in the *Punica,*" *Classical Philology,* 1955, *50:*1–20; Herrmann, "Le cas d'Atilius Regulus" (cit. n. 7), p. 159; Michel Martin, "Le monstre de Bagrada," *Eidolon,* 1979, *7:*21–42; Spaltenstein, *Commentaire des Punica* (cit. n. 10), p. 400; Uwe Fröhlich, *Regulus, Archetyp römischer Fides* (Tübingen: Stauffenburg, 2000), pp. 186–189; and Jones, *Instinct for Dragons* (cit. n. 1), pp. 138–139.

[14] Units of length cited by the ancient authorities include the foot, cubit, fathom, and plethrum. It is sufficient here to equate the Roman foot with the modern English foot and to convert the variable Greek and Roman cubit everywhere using the approximation 1 cubit = 1½ feet. Also adopted are 1 fathom = 6 feet and 1 plethrum = 100 feet. To convert to the metric system, note that 1 foot = 0.305 meter. But for reasons that will become clear, all lengths will be quoted in the original units of the ancient texts, except that the cubit is here converted to feet (flagged as *feet).

[15] I consulted numerous references on modern snakes for the present study, but only five will be cited here: H. W. Parker and K. P. Schmidt, "Snakes," in *Encyclopaedia Britannica* (Chicago: Benton, 1962); Parker and Schmidt, "Python," *ibid.;* Clifford H. Pope, *The Giant Snakes* (New York: Knopf, 1973); Chris Mattison, *The Encyclopedia of Snakes* (New York: Facts on File, 1995); and John C. Murphy and Robert W. Henderson, *Tales of Giant Snakes: A Historical Natural History of Anacondas and Pythons* (Malabar, Fla.: Krieger, 1997).

of scales along the body; the rib and spine structure underneath the scaly skin (evidently detected in a postmortem examination); and the large number of ventral scutes enabling progress over uneven surfaces. It is noteworthy, too, that Orosius did not describe any obvious differentiation of neck, body, and tail—again, support for the idea of a large snake.

What, then, about the reported length? Three alternative explanations may be suggested. First, this may not have been a true snake—as Pontoppidan conjectured without giving specific reasons. Second, Orosius's original source may have recorded the number of ribs, or rib pairs, as 120, a figure that later became misinterpreted as the number of "feet" of the animal's length owing to confusion arising from the source's mention of "the feet of the ribs." This explanation seems plausible given that the number of ribs in a snake may exceed 300 pairs. A third possibility is that some snakes two millennia ago may have attained lengths of 120 feet. To credit this, one would have to locate other reliable ancient testimony to the same effect. The discussion therefore now turns to the largest snakes recorded in classical antiquity.

TERRESTRIAL SERPENTS

The adjective "terrestrial" is here meant to refer to those serpents that live primarily on land. Although there exist some snakes, like pythons, that also spend time in the water and even go to sea, these creatures will be grouped with the landlubbers. Terms in Latin authors that are used to refer to the largest terrestrial snakes include, besides *serpens,* the very general *anguis,* as well as *draco, vipera,* and *boa;* the Greek equivalents are ὄφις, δράκων, and ἔχιδνα (or ἔχις). Our English words for large snakes—"serpent," "dragon," "viper," and "boa"—derive from these ancient terms, as does our word "python" (from Πύθων, the great snake killed by Apollo at Delphi). (See Figure 2.) Generally speaking, the ancient authors distinguished between the highly venomous biting snakes (vipers) and the nonvenomous squeezing and biting snakes (pythons and boas). Otherwise, their taxonomy was very crude, reflecting mostly superficial characteristics such as visual appearance, living habits, and noxious effects.

Africa

Aristotle (ca. 350 B.C.) presented a brief report that huge snakes once entered the sea off North Africa and overturned a fleeing trireme (a ship about 120 feet long).[16] This feat indirectly supports the Roman account of a huge snake at the Bagradas River in 256 B.C.

Diodorus Siculus (ca. 30 B.C.), in describing the snakes of ancient Ethiopia—which meant all lands south of Egypt—publicized the fabulous reports that the biggest snakes there attacked elephants and measured up to 150 *feet (cubit-converted feet) long. Distrusting so large a figure, however, he also told with more confidence of a well-authenticated case in the time of Ptolemy II Philadelphus, King of Egypt (283–246 B.C.), when the king exhibited a tamed Ethiopian snake 45 *feet long at Alexandria. This snake had been netted after a terrifying hunt in which the animal first killed two hunters by biting one and squeezing the other and then resisted an onslaught of arrows and stones. Pausanias (ca. A.D. 150) and Philumenus (ca. A.D. 180) also mentioned African snakes 45 *feet long, perhaps from the same source, Agatharchides (ca. 120 B.C.), that Diodorus used. On the other hand, Aelian (ca. A.D. 225) said that Ptolemy Philadelphus had actually received two

[16] Aristotle, *History of Animals* 606b9–14.

Figure 2. *Python in the grotto at Delphi. Greek vase (fifth century B.C.). By permission of the Bibliothèque Nationale de France, Paris. (BNF Vase 306.)*

snakes, 21 *feet and 19½ *feet long; it may be more than coincidental that the two lengths add up to nearly 45 *feet. He also cited Nymphis (ca. 250 B.C.) for the occurrence of 22½-*foot "vipers" near the Red Sea. Otherwise, he repeated the traditional lore for the biggest snakes given by Diodorus. In southern Egypt, some desert monks (ca. A.D. 400) also reported a snake 22½ *feet long, according to their fellow monks Rufinus and Palladius, but it was not classified as to type.[17]

Clearly, there exists no certain ancient evidence for any African snake larger than the modern rock python (*Python sebae*), which can grow to 30 feet. The possible exceptions are Ptolemy Philadelphus's large specimen and the reptiles reported in the two North African incidents. In modern times, rock pythons have not ranged north of the southern Sahara Desert. Pliny the Elder stated, however, that large snakes would sometimes swim in small groups across the Red Sea from Ethiopia to Arabia.[18] If his report is true, this might have extended their eastward range in antiquity.

India

The large snakes of India are described by more extant ancient writings (mostly as brief mentions in literary fragments) than those of any other country, thanks to Alexander the Great's career of conquest there in 327–325 B.C. Participants in that remarkable adventure have provided the following dimensions for the largest snakes. Nearchus, commander of Alexander's fleet, and Aristobulus, a key army technician, who were the most sober and reliable of the Alexander historians, said that they saw snakes about 24 *feet and 13½ *feet long, respectively, although they also heard rumors of larger ones. Such rumors were eagerly repeated by Onesicritus, Nearchus's lieutenant, who told of some Indian ambassadors whose king, Abisarus, reportedly kept as pets two snakes 120 and 210 *feet in length. Alexander's army is also said to have passed a cavern containing a sacred snake, reputed by the Indians to measure 105 *feet, but all the army actually saw was its head, with eyes that seemed to the terrified soldiers to be as large as round shields.[19] The Indians were obviously playing jokes on the unwelcome Macedonians, whose eager king was always pressing to behold such ophiological wonders.

During the two generations immediately following Alexander's death in 323 B.C., legends of huge ox-swallowing and elephant-toppling snakes in India whetted the public's appetite for marvels, feeding the nascent Alexander Romance. Megasthenes and Deimachus, two Greek ambassadors in India, were particularly to blame. One of the post-Alexandrian writers consulted by Maximus of Tyre (ca. A.D. 180) said that the great snakes were as long as 5 plethra (500 feet). The Greek historian Cleitarchus, however, more soberly transmitted Nearchus's reported length of 24 *feet.[20]

[17] Diodorus Siculus, *Library of History* 3.10, 3.36–37; Pausanias, *Description of Greece* 2.28.1; Philumenus, *Poisonous Animals* 30; Agatharchides in Photius, *Bibliotheca* 250; Aelian, *Nature of Animals* 2.21, 16.39, 17.3; Rufinus, *History of Monks* 8; and Palladius, *Lausiac History* 52. From an unknown source Pliny the Elder, *Natural History* 8.35, gives 30 *feet as the length of large African snakes. The reported length of the snake exhibited by Ptolemy Philadelphus has been defended in Liliane Bodson, "A Python (*Python sebae* Gmelin) for the King," *Museum Helveticum,* 2003, *60:*22–38.

[18] Pliny the Elder, *Natural History* 8.35.

[19] For the various reports see Strabo, *Geography* 2.1.9, 15.1.28, 15.1.45; Arrian, *Indica* 15.10; and Aelian, *Nature of Animals* 16.39. For the report of the sacred snake see *ibid.* 15.21.

[20] Regarding the reports of the Greek ambassadors see Strabo, *Geography* 2.1.9; Pliny the Elder, *Natural History* 8.36; Aelian, *Nature of Animals* 16.41; and Solinus, *Collection* 26. For the figure of 5 plethra see Maximus of Tyre, *Dissertations* 8.6. For more sober views see Cleitarchus in Aelian, *Nature of Animals* 17.2; and Diodorus Siculus, *Library of History* 17.90. Pliny the Elder, *Natural History* 8.35, also credits a number on the order of 30 *feet.

The Augustan age received new, independent information about large snakes in India. Strabo, in the course of traveling around Egypt, saw a snake brought from India that was about 13½ *feet in length.[21] Suetonius (ca. A.D. 120), who had personal access to Augustus's imperial archives, informs us that this emperor displayed "a snake of 75 *feet in front of the Comitium [Roman assembly area]." Since this information is included along with reports of public exhibitions of a rhinoceros and a tiger, we may assume that the snake came from India. But what about the "75 *feet"? Pausanias and Philostratus (ca. A.D. 210) claimed that Indian snakes could grow to 45 *feet or even more, while Philostorgius (ca. A.D. 425) said that he saw in Roman territory the skins of Indian snakes measuring up to 15 fathoms (90 feet) in length. Since the modern Indian python (*P. molurus*) reaches only 20 feet, the lengths mentioned by Suetonius and Philostorgius—who otherwise should be regarded as reliable authorities—suggest either the existence of much larger specimens in the historical past or, more likely, a display of circus-show hyperbole by the Roman exhibitors.[22] Antiquity doubtless had its P. T. Barnums, too.

Ancient reports of enormously long worms and eels in the major rivers of India also survive, but the descriptions often sound more like pythons. Ctesias (ca. 400 B.C.) mentioned bulky worms more than 10½ *feet long in the Indus River and reported that they crawl out onto land at night and devour large animals such as oxen. Statius Sebosus (ca. A.D. 50) claimed that some blue worms in the Ganges River are endowed with pairs of gills measuring 9 *feet in length and are strong enough to carry off elephants with their teeth. Although some present-day aquatic worms can grow to over 12 feet in length and can consume small animals, it is not possible to sort out whether the ancient accounts are mixing up worms and snakes. Similarly, Pliny the Elder and Solinus (ca. A.D. 200) said that eels (*anguillae*) in the Ganges River reach 30 feet in length, but they were probably referring to snakes (*angues*).[23]

Middle East

Aelian transmits brief accounts of giant snakes on the island of Chios, as well as near Ephesus and in Phrygia—the last reportedly spawning snakes up to 60 feet in length. But

[21] Strabo, *Geography* 15.1.45. More generally, archaeological finds in India as well as other historical testimony indicate a renewal of direct Western contact with India during the Augustan age; see R. E. M. Wheeler, *Rome Beyond the Imperial Frontiers* (London: Bell, 1954). Aggressive Roman traders in the first to sixth centuries A.D. might even have brought *Python reticulatus,* the largest of the pythons, from Southeast Asia to the West; the longest modern specimens reach slightly over 30 feet.

[22] Suetonius, *Augustus* 43; Pausanias, *Description of Greece* 2.28.1; Philostratus, *Apollonius of Tyana* 3.6; and Philostorgius, *Ecclesiastical History* 11, epitomized by Photius. Stretching a snake skin can increase its length by only a few percent; stitching together several snake skins can work wonders. Such frauds employing snakes seem to have been common in antiquity. I have already mentioned the Indian tricks played on Alexander the Great. The pseudo-priest of Aesculapius, Alexander of Abonoteichus (ca. A.D. 160), used both real snakes and hand-crafted models in his deceptions: Lucian, *Alexander the False Prophet* 12–16. Ancient frauds using various animals are well discussed in Mayor, *First Fossil Hunters* (cit. n. 2), Ch. 6.

[23] On the Indus River worms see Aelian, *Nature of Animals* 5.3; and Ctesias in Photius, *Bibliotheca* 72. Those in the Ganges River are mentioned by Statius Sebosus, cited in Pliny the Elder, *Natural History* 9.46; and Solinus, *Collection* 53. Pliny mistakenly quotes the length of Ganges worms as 90 (not 9) *feet; Solinus usually follows Pliny but sometimes provides a needed correction. On present-day aquatic worms see W. R. Coe, "Nemertina," in *Encyclopaedia Britannica* (Chicago: Benton, 1962). Regarding the Ganges "eels" see Pliny the Elder, *Natural History* 9.4; and Solinus, *Collection* 53. Kitchell traces the development of Ganges worm and eel lore through the Middle Ages, although he misstates some of the numbers and representations in Aelian, Pliny, and Solinus: Kenneth F. Kitchell, Jr., "The View from Deucalion's Ark: New Windows on Antiquity," *Classical Journal,* 1993, *88:*341–357.

the Phrygian reports are only hearsay, according to Aelian, and so we are entitled to ignore them.[24]

Arabian snakes are sometimes reported as being very large. Aelian cited a certain Alexander (probably Alexander of Myndus, ca. A.D. 25) for the existence of snakes 60 *feet long in the area of the Arabian Sea. Aelian's contemporary Solinus, however, referred to these snakes only as more than 30 *feet long and as having their lair in the Strait of Hormuz, which leads to the Arabian Sea. Philostratus, another contemporary, claimed that they descend from their mountain homes and swim far out to sea.[25] These were most likely Indian pythons, roaming somewhat westward of their present range. This inference is consistent with Solinus's remark that some Indian snakes swim way out into the Indian Ocean, well beyond their normal range. Accordingly, some of them may have strayed permanently west of the Indus River valley.

Europe

The only ancient account of a truly large, apparently indigenous Italian snake occurs in the Roman prodigy list of Cassius Dio (ca. A.D. 229) for the year 32 B.C., where it is said that a two-headed serpent 85 feet in length appeared in Etruria and was killed by lightning after doing much harm. The provenance of such a fantastic report at so well documented a period and place is hard to discern. The account looks like a borrowing from standard dragon lore. It recalls Hesiod's myth of Typhon, a monster with a hundred snake heads who was killed by Zeus's lightning bolts.[26] The purpose of such a fiction in 32 B.C. seems to have been largely political: at that time, two powerful leaders, Octavian and Mark Anthony, were vying militarily for dominion over the Roman world. Dio implies this message very clearly by linkage.

Pliny the Elder and Solinus wrote of native Italian *boae,* a term generally understood today to refer to vipers, whose length normally does not exceed 3 feet.[27] Giving an example of a *boa,* however, they said that one swallowed a small child on the Vatican Hill at Rome during the reign of the emperor Claudius (A.D. 41–54). (See Figure 3.) This *boa* was probably a python, imported from Africa or India.

MARINE SERPENTS

Contrary to popular impression, ancient reports of sea creatures that people of the time regarded as sea monsters but are different from things that we can easily identify today are surprisingly infrequent outside the mythological literature. Oudemans, Heuvelmans, and Ellis, however, have clearly recognized this fact. The Latin and Greek terms used to describe these rare, mysterious monsters are *anguis,* δράκων, κῆτος, and σκολόπενδρα. On the other hand, it must be emphasized that the ancient authors were unable to differentiate between fact and fiction in the case of most of these sea creatures. Making this

[24] Aelian, *Nature of Animals* 2.21, 16.38–39.

[25] *Ibid.* 17.1; Solinus, *Collection* 53, 55; and Philostratus, *Apollonius of Tyana* 3.8.

[26] Cassius Dio, *Roman History* 50.8.4; and Hesiod, *Theogony* 820–868 (other snake-headed monsters are discussed at 295–336). The two-headedness of the Etruscan snake recalls the description of the *amphisbaena,* an unidentified African snake that appeared to possess a head at each end of its body: Pliny the Elder, *Natural History* 8.85; Nicander, *Theriaca* 372–383 (with scholium); Solinus, *Collection* 28; Aelian, *Nature of Animals* 9.23; and Philumenus, *Poisonous Animals* 27. The *amphisbaena* is probably a real animal, according to Gow and Scholfield, *Nicander: Poems and Poetical Fragments* (cit. n. 4), pp. 177–178.

[27] Pliny the Elder, *Natural History* 8.37; and Solinus, *Collection* 2. Gossen and Steier, "Schlange" (cit. n. 4), col. 530, identify *boae* as vipers.

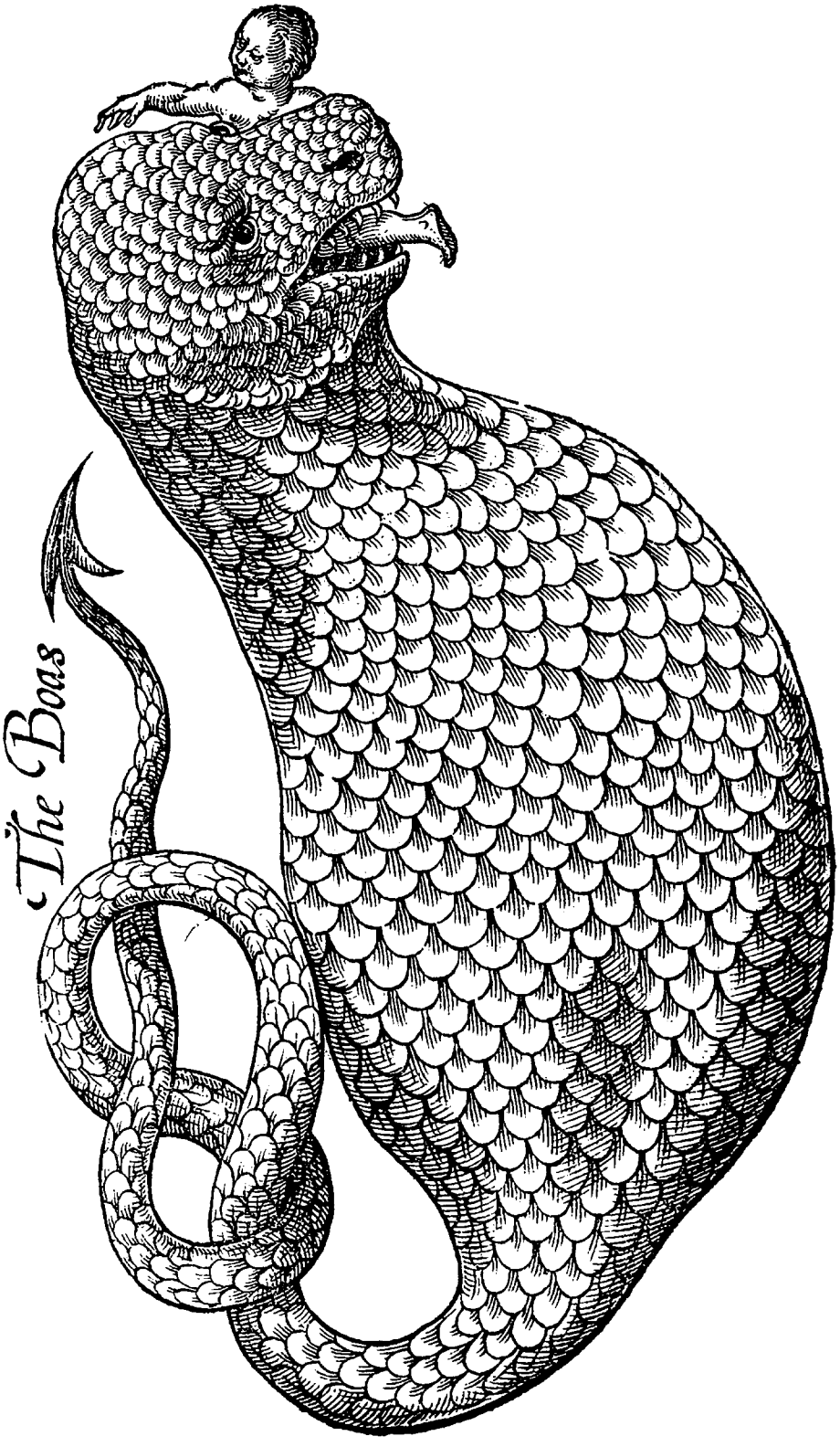

Figure 3. *Boa devouring a child. Engraving from Edward Topsell,* The History of Four-Footed Beasts and Serpents *(London, 1658). By permission of the Rare Books Division, New York Public Library, Astor, Lenox, and Tilden Foundations.*

distinction has required a modern judgment call, but such a call is still subject to much dispute and uncertainty.

The most general term used is κῆτος (Latin *cetus*). In nonmythological literature a creature so designated can almost always be identified with a whale, dolphin, or large fish, although in mythology and art it routinely appears as some kind of monster, often a hybrid of different kinds of animals, not all of them marine.[28] It need not concern us here.

A sea monster known as the leviathan is mentioned in the Bible (Old Testament) and in north Phoenician mythological texts from Ugarit (fourteenth century B.C.).[29] The leviathan has been identified variously as a crocodile, a whale, a hippopotamus, and a sea serpent. Like the semi-aquatic behemoth and other fabulous sea monsters of the protohistorical period, the leviathan does not really enter later history except as myth or legend. It will therefore not be profitable to discuss it further.

In 210 B.C., according to a Roman prodigy list recorded in Livy, "snakes of a remarkable size leaped up and down in the manner of fish sporting about at Tarracina in the sea not far from the harbor." The town of Tarracina lies about 65 miles south of Rome. If, as seems likely, the "snakes" were viewed from the harbor itself, distance might have played games with the eyes, and therefore we might interpret the "snakes" as simply a line of leaping dolphins or the flailing arms of a giant squid (or octopus). Or perhaps they were the bodily undulations of Heuvelmans's "super-eel," a speculative creature dubiously inferred from a few modern sightings.[30] (See Frontispiece.)

A well-documented case of a sea monster about 100 feet long and over 7 feet wide both in jaw size and in body size, displaying "scales" 4 feet long, was reported by the Syrian polymath Posidonius (ca. 75 B.C.). His account was quoted by Strabo in a discussion about the Syrian coastal plain:

> As for the plains, the first, beginning at the sea, is called Macras, or Macra-Plain. Here, as reported by Posidonius, was seen the fallen dragon, the corpse of which was about a plethrum in length, and so bulky that horsemen standing by it on either side could not see one another; and its jaws were large enough to admit a man on horseback, and each flake of its scales exceeded an oblong shield in length.

Although the "scales" suggest some kind of sea dragon, as they did to Posidonius, the large size of the jaw does not, except for certain extinct marine reptiles like pliosaurs and mosasaurs. However, the term "scaly" was sometimes used by the ancients to describe the skin of a whale; it is therefore likely that this monster was in fact a large whale.[31] On the

[28] In addition to the works of Oudemans, Heuvelmans, Cotte, Ellis, Boardman, and Papadopoulos and Ruscillo cited in note 3, above, many other references for sea creatures could be given: e.g., Richard Ellis, *Encyclopedia of the Sea* (New York: Knopf, 2000).

[29] In the Bible see esp. Psalms 74:13–14, 104:25–26; Isaiah 27:1; Job 41:1–34. See also Edmond Jacob, *Ras Shamra-Ugarit et l'Ancien Testament* (Neuchatel: Delachaux & Niestlé, 1960), pp. 74, 94–95; and John Day, *God's Conflict with the Dragon and the Sea* (Cambridge: Cambridge Univ. Press, 1985). The behemoth in Job 40:15–24 has been labeled a crocodile, a hippopotamus, an ox, and a dragon.

[30] Livy, *Roman History* 27.4.13; and Heuvelmans, *In the Wake of the Sea-Serpents* (cit. n. 3), pp. 543–544.

[31] Strabo, *Geography* 16.2.17, trans. by Horace L. Jones, *Strabo: Geography,* Vol. 7 (Cambridge, Mass.: Harvard Univ. Press, 1930), pp. 261–263. For a description of the skin of a whale as "scaly" see Arrian, *Indica* 39.4–5. In 58 B.C. bones alleged to be those of the sea monster that Perseus slew in order to save Andromeda were brought from Joppa (Jaffa) in Judaea to Rome; see Pliny the Elder, *Natural History* 9.11. The skeleton, 40 feet in length, was probably that of a whale or a shark. Mayor, *First Fossil Hunters* (cit. n. 2), pp. 138–139, thinks that it might have been a fake composite of whale and fossil bones, although she considers the Macras dragon a whale carcass. Papadopoulos and Ruscillo, "*Ketos* in Early Athens" (cit. n. 3), p. 213, appear to regard the Joppa bones as a whale skeleton.

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other hand, since true fish (unlike mammals) continue to grow until they die, it is also possible that this was a species of large shark, even though no known modern shark exceeds about 50 feet in length (some prehistoric sharks approached 100 feet).

A still more puzzling creature was described by Aelian in his discussion of the unusual animals of his day:

> Now in the course of examining and investigating these subjects and what bears upon them, to the utmost limit, with all the zeal that I could command, I have ascertained that the Scolopendra is a sea-monster, and of sea-monsters it is the biggest, and if cast up on the shore no one would have the courage to look at it. And those who are expert in marine matters say that they have seen them floating and that they extend the whole of their head above the sea, exposing hairs of immense length protruding from their nostrils, and that the tail is flat and resembles that of a crayfish. And at times the rest of their body is to be seen floating on the surface, and its bulk is comparable to a full-sized trireme. And they swim with numerous feet in line on either side as though they were rowing themselves (though the expression is somewhat harsh) with thole-pins hung alongside. So those who have experience in these matters say that the surge responds with a gentle murmur, and their statement convinces me.

(See Figure 4.) The footlike appendages account for the name Scolopendra, since the common sea scolopendra was a type of myriapod worm, familiar to the ancient fishermen. Two epigrammatic poets also described the Scolopendra, although we cannot be certain that they were claiming actual occurrences of it. Theodoridas (ca. 225 B.C.) mentioned the large rib of a thousand-footed Scolopendra that washed up on the Calabrian shore in Italy, while Antipater (probably of Sidon, ca. 100 B.C.) described the mutilated remains of one that was 8 fathoms (48 feet) long, discovered on a Mediterranean beach.[32]

It is not immediately clear what the Scolopendra really was. No known creature, living or extinct, has possessed such a large number of flippers (or fins). If we are dealing with a large whale of about 120 feet in length, what appeared to be "feet" could have been suckerfish attached to its belly, as T. H. White has speculated.[33] Although White offers an alternative conjecture that the Scolopendra was a giant squid, this suggestion seems to be at greater variance with the reported mode of locomotion and with the creature's other physical characteristics. If it was in fact a whale, ripples in the water around its body could have resembled feet or could have been interpreted as having been caused by feet.

RECEPTION OF SERPENT LORE IN THE EARLY MIDDLE AGES

The roots of medieval serpentology lie in the natural history, folklore, and mythology of classical antiquity. It is not my intention here to delve into the development of serpentology during the Middle Ages, a topic beyond the scope of this study. The present objective is to trace, in brief, the introduction of ancient serpent lore into the earliest medieval texts, with special emphasis on the content of natural history as opposed to that of primitive mythology.

During the Augustan age, the lexicographer Verrius Flaccus (as epitomized by Festus

[32] Aelian, *Nature of Animals* 13.23, trans. by A. F. Scholfield, *Aelian: On the Characteristics of Animals,* Vol. 3 (Cambridge, Mass.: Harvard Univ. Press, 1959), p. 123. On the common sea scolopendra see Aristotle, *History of Animals* 505b13–18, 621a6–12; Pliny the Elder, *Natural History* 9.145, 32.151; and Oppian, *Halieutica* 1.306–307, 2.424–433. For the poems of Theodoridas and Antipater see *Greek Anthology* 6.222, 6.223. Mayor, *First Fossil Hunters* (cit. n. 2), p. 264, regards the rib as a fossil.

[33] T. H. White, *The Bestiary: A Book of Beasts* (New York: Putnam, 1954), pp. 265–266. White incorrectly attributed the passage in Aelian to Pliny the Elder.

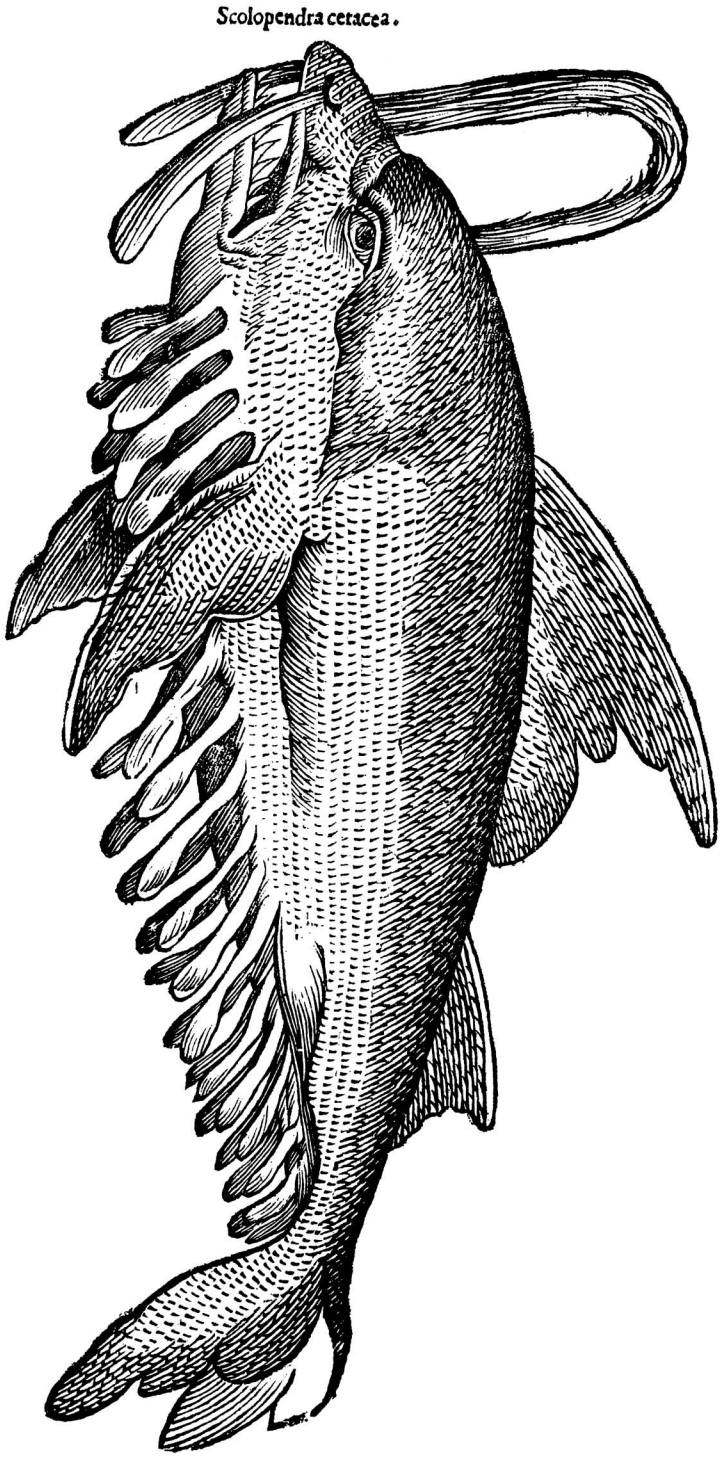

Figure 4. Scolopendra cetacea. *Engraving from Ulisse Aldrovandi,* De animalibus insectis libri septem *(Bologna, 1638). By permission of the Science, Industry, and Business Library, New York Public Library, Astor, Lenox, and Tilden Foundations.*

in the second century A.D.) transmitted Greek tradition in categorizing the *dracones* etymologically by their keen eyesight. So too did Macrobius (ca. A.D. 400). The Greek δέρκεσθαι means "to see." The epic poet Lucan (A.D. 65) made particular mention of their golden sheen, and indeed the iridescent scales of some members of both *P. molurus* and *P. sebae* do glitter like gold or silver.[34] Philostratus also dwelt on this remarkable iridescence in his description of the mountain dragons of India, to which he added, probably drawing on the Alexander historians or their successors, a number of more fantastic details that closely resemble the features of our modern image of a dragon: fiery eyes, red crest, beard, and serrated back. Megasthenes, the Greek ambassador to India, and Lucan both included wings.[35] The ultimate source of these elements may be the tall tales—or even the myths—of the Indians, since African dragons usually were not so fantastically endowed by the ancients.

Most of the early medieval lore about sea serpents, on the other hand, springs from the Roman mythologizing poets, especially Virgil in the Augustan age. Virgil's fanciful description of the two sea serpents that attacked Laocoön and his sons—with their fiery eyes, red crests, and undulating backs—appears to be a forerunner of the similar description of the land dragon by Philostratus. Heuvelmans has conjectured that Virgil's sea serpents might have been rooted in reality, being the rarities known today as oarfish. The oarfish can grow to a length of over 20 feet, and though it is in fact a weak and harmless creature, its size and its blood-red mane, at the head of a dorsal fin that runs along a ribbon-like silvery body, make it an intimidating sight.[36]

A "scientific" differentiation was made in early medieval times between the huge dragon (*draco*) and the more ordinary snakes (*coluber, anguis,* and *serpens*). Although Virgil did not make this distinction and used the four terms interchangeably, it was introduced explicitly by the Christian writers Arnobius (ca. A.D. 300), Ambrose (ca. A.D. 390), and Isidore of Seville (A.D. 636) and by various authors of medieval bestiaries. Probably it appeared originally in one of the early versions of *Physiologus,* a Greek moralizing collection of natural history anecdotes composed between the second and fourth centuries A.D., which long served as a convenient source of zoological material for the bestiary writers.[37]

[34] Festus, *Epitome,* s.v. "Dracones"; Macrobius, *Saturnalia* 1.20; and Lucan, *Pharsalia* 9.727–733. This last is in contrast to Ovid, *Metamorphoses* 3.38, who described the serpents as blue, following Pseudo-Hesiod, *Shield of Heracles* 167.

[35] Philostratus, *Apollonius of Tyana* 3.6–8; Aelian, *Nature of Animals* 16.41; and Lucan, *Pharsalia* 9.730. Although Apollonius of Tyana (first century A.D.) is said to have visited India, it is unlikely that Philostratus took this description of dragons from Apollonius's biographers, since the textual matter is presented explicitly as background material. The crest was mentioned for non-Indian *dracones* by Juba II, King of Mauretania (ca. A.D. 20), in Pliny the Elder, *Natural History* 8.35 (who criticized Juba's error), and the beard by Nicander (second century A.D.), *Theriaca* 438–444 (with scholium), while Silius Italicus (ca. A.D. 100), *Punica* 6.219, described the mouth as smoking. Mayor, *First Fossil Hunters* (cit. n. 2), pp. 129–135, interprets the Indian dragons as inventions inspired by fossil bones from the Siwalik Hills, but the overall evidence from the time of the Alexander historians on strongly suggests living snakes, possibly with extraneous embellishments supplied by fossil discoveries.

[36] Virgil, *Aeneid* 2.201–227; and Heuvelmans, *In the Wake of the Sea-Serpents* (cit. n. 3), pp. 84–86. The Laocoön Group (first century B.C. or A.D.) in the Vatican Museum depicts the serpents as ordinary snakes of extraordinary length.

[37] Arnobius, *Against the Pagans* 7.46(43); Ambrose, *Hexameron* 5.2; Isidore of Seville, *Etymologies* 12.4.1–5; and White, *Bestiary* (cit. n. 33), pp. 165–167. Ambrose, however, describes only the viper in detail (5.7). The pagan scholar Servius (ca. A.D. 400), *Commentary on Virgil's Aeneid* 2.204, seems to be unaware of the Christian distinctions. On medieval bestiaries see, e.g., Willene B. Clark, "Zoology in the Medieval Latin Bestiary," in *Man and Nature in the Middle Ages,* ed. Susan J. Ridyard and Robert G. Benson (Sewanee, Tenn.: Univ. South Press, 1995), pp. 223–245.

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In the early medieval bestiaries, some of the wilder flights of fancy of the Alexander historians and their successors seem to be missing. Although a few legends about the dragon—such as the red crest and the elephant-toppling ability—persist in these accounts, most of the other facts about serpents are correct. This must be due to the general medieval reliance on encyclopedic authorities like Pliny the Elder, Solinus, and Aelian. Another restraining factor, generally overlooked by modern scholars, is doubtless the Bagradas River incident, which crops up repeatedly in early medieval authors such as Arnobius, Orosius, and John of Damascus. Matter-of-fact accounts of medieval incidents involving serpents, like the story of St. Martin of Tours (ca. A.D. 375) and the river snake, must also have served as a reality check on the bestiary writers.[38] It is only much later that the extravagant picture provided by ancient sensationalists like Philostratus took over from the more cautious views of the early bestiarists.

CONCLUSION

To conclude: are we dealing with zoology or with cryptozoology? On the whole, the evidence is strong that most ancient reports of exceptionally large terrestrial serpents refer to snakes of the genus *Python.* The only reported aspects of these serpents that are problematic concern their maximum size and their geographical range. Before the modern-day decimation of many species of Eurasian animals, pythons may well have lived longer and ranged farther afield than today's specimens. Estimates of the lengths of snakes that are not based on direct measurement, however, are subject to large possible error, as John Murphy and Robert Henderson have shown for modern pythons.[39] There is no solid evidence for any ancient African or Indian python longer than about 25 feet, which is comparable to the maximum size encountered today. So many ancient claims and rumors of snakes 45 feet in length or more survive, however, that it is hard to deny categorically that they actually existed.

As for the geographical range of pythons in antiquity, there is credible evidence that the Indian python extended somewhat westward of the Indus River valley, at least as far as the Strait of Hormuz. This interpretation is geographically more likely than that the sub-Saharan rock python ranged all the way across the Red Sea, Arabian Peninsula, and Persian Gulf. However, the dry southern Iranian habitat might have been unfavorable for the Indian python. In North Africa, pythons appear to have inhabited the Mediterranean coast to the west of Egypt. Several possible explanations for their presence there come to mind. These pythons might have been sub-Saharan or Indian pythons imported to, and then released from, Carthage or other cities in North Africa. Or they might have been sub-Saharan pythons that had made their way north across the Sahara during one of the more humid periods, when the vast desert stretching from the western Sahara to western China was pockmarked with lakes, marshes, and rivers. The most recent of these periods occurred about four thousand years ago. Although a core desert north of the Tropic of Cancer has

[38] Sulpicius Severus, *Dialogues* 3.9; Paulinus, *Life of St. Martin* 5.616–636; and Fortunatus, *Life of St. Martin* 4.272–283. At St. Martin's command, a threatening snake swimming across a river turned back. In contrast, the dragon stories of St. Hilarion of Gaza (ca. A.D. 370) and of St. Donatus of Epirus (ca. A.D. 380) contain many exaggerations, drawn from the Greek myth of Apollo and the Python and from Indian lore: Jerome, *Life of St. Hilarion* 39; and Sozomen, *Ecclesiastical History* 7.26. St. George (ca. A.D. 303) and the dragon first appear together in the late Middle Ages, the legend being based in part on the Greek myths of the dragonslayers Perseus and Heracles.

[39] Murphy and Henderson, *Tales of Giant Snakes* (cit. n. 15), pp. 47, 55–56.

probably existed for millions of years, it might have been passable in places at various times. Or the pythons might have migrated down the Nile River valley. On the assumption that the reported North African pythons had been indigenous in the southern Mediterranean for at least several thousand years, they probably would have belonged to a different, unnamed species.[40] Habitat destruction and slaughter in the Mediterranean basin over many centuries during and after classical antiquity could easily account for their absence there today.

A handful of ancient reports do remain puzzling, however. Ostensibly, these North African serpents and the possibly related Scolopendra possessed numerous "feet" and could grow to lengths of 120 feet. There is reason, nevertheless, to believe that both textual and scientific misunderstandings in antiquity led to these remarkable claims and that, in reality, the large North African serpents were only pythons and the Scolopendra a whale. Furthermore, if any credence is given to Oudemans's composite sketch of a modern sea serpent, these ancient creatures cannot fit his model, since Oudemans depicted an animal with a long tail, long neck, small head, and sleek body. Nor do they fit any of Heuvelmans's nine types of sea serpents or any of Ellis's "best documented" cases.

Although this search for sea serpents and land dragons has come up short in the literature of classical antiquity, it has been possible to discern the main factors that turned observations of ordinary (albeit large) snakes and sea creatures into images of frightful monsters. This metamorphosis took place slowly throughout antiquity and continued into the Middle Ages. The chief factors responsible include mismeasurement of sizes, with a tendency to overestimate; relatively poor views of rare animals, with misunderstanding of what had been seen; ignorant conflation of different kinds of animals; willful exaggeration, either to entertain or to frighten; and misreading of earlier textual descriptions. It does not seem necessary to invoke either Carl Jung's notion of vague archetypal images from the "collective unconscious," as Peter Hogarth and Val Clery and also Bernard Heuvelmans have done for monsters generally, or Carl Sagan's more farfetched idea about primitive racial memories of Mesozoic dinosaurs to explain dragons in particular.[41] It is important to remember, as well, that at the same time that the historical transformation of fact into myth was occurring, a more scientific historical tradition—reinforced by accurate new observations—was running parallel to it. The rational was winning out over the irrational.

It is likely that a similar transformation took place during the protohistorical era and that this can explain the earliest serpent myths—at least in part. Yet these very primitive myths of snake-headed monsters (like Typhon and the Gorgon, Echidna, Chimaera, and Hydra) never strayed outside the realm of "old" mythology during the later historical period. The developing "new" serpent myth owes little, or nothing, to Hesiod and other early poets.

[40] E.g., the dog (*Canis familiaris*) developed from the wolf (*C. lupus*) in only several thousand years. On the humid periods see Zhongwei Yan and Nicole Petit-Maire, "The Last 140 ka in the Afro-Asian Arid/Semi-Arid Transitional Zone," *Palaeogeography, Palaeoclimatology, Palaeoecology,* 1994, *110:*217–233.

[41] Hogarth and Clery, *Dragons* (cit. n. 1), pp. 195, 204; Bernard Heuvelmans, "The Metamorphosis of Unknown Animals into Fabulous Beasts and of Fabulous Beasts into Known Animals," *Cryptozoology,* 1990, *9:*1–12; and Carl Sagan, *The Dragons of Eden: Speculations on the Evolution of Human Intelligence* (New York: Random House, 1977), pp. 138–151. David Jones, *Instinct for Dragons* (cit. n. 1) would derive a universal dragon image from our primal fears of snakes, carnivores, and birds of prey. These Jungian notions may well play a role in the "old" mythology, if not the "new."

Even today, the philosophy that guided ancient and medieval writers about exotic beasts flourishes occasionally in modern studies of more recent sightings of unusual animals. Often we find an exaggerated acceptance of older authority and a wishful belief in the marvelous. If the present study does nothing more, it may illustrate the potential for discovering factual truth in an apparent morass of pure fantasy by applying modern scientific and historical methodology.